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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/071,218	02/07/2002	Ross Halgren	47868/DBP/C664	9260

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EXAMINER	
LEE, DAVID J	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/071,218	HALGREN ET AL.	
	Examiner	Art Unit	
	David Lee	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,13,14,18-27 and 31-37* is/are rejected.

7)☒ Claim(s) *10-12,15-17 and 28-30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 36 and 37 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form. Claim 36 discloses a network comprising the node of claims 1 or 13. Claim 37 discloses a network arranged to implement the method of claims 18 or 31.

2. Claim 21 is objected to because of the following informalities: "10" should be changed to --20--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 33-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 33 recites the limitation "the second network interface unit" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 18 and 37/18 are rejected under 35 U.S.C. 102(e) as being anticipated by Lin et al. (US Pub. No. 2002/0194339).

Regarding claims 18 and 37/18, Lin teaches a method of conducting path protection in a WDM optical network, the method comprising the steps of: receiving a data signal at a tributary receiver unit of a network node (Client of fig. 1), detecting a loss of lock (LOL) in the data signal received at the tributary receiver unit based on a comparison of an actual data rate received and a reference rate for said data signal (paragraph 0014: loss of lock and loss of light are the same), and switching receipt of said data signal at the tributary receiver unit from a working path to a protection path of the WDM optical network (working and protection routes of fig. 1).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-3, 5, 19-21, 23, and 36/1 are rejected under 35 U.S.C. 102(e) as being anticipated by Lin et al. in view of Maeda et al. (US Pub. No. 2003/0039207 A1).

Regarding claims 1-3, 5, 19-21, 23, and 36/1, Lin teaches a node for use in a WDM optical network, the node comprising: a tributary receiver unit for receiving a data signal distributed via the WDM optical network and destined for said node (Client of fig. 1), a path protection switching unit for switching receipt of said data signal at the tributary receiver unit from a working path to a protection path of the WDM optical network (working and protection routes of fig. 1), and a control unit for the path protection unit to detect a loss of light (LOL) in the data signal received at the tributary receiver unit based on a comparison of an actual data rate received and a pre-programmed reference rate for said data signal (paragraph 0014). Loss of lock as used by the applicant and loss of light as used by Lin and Maeda are considered the same because both are based on a comparison of an actual data rate and a reference rate and are measured according to a BER-related value (see paragraph 0012 of Maeda). Lin does not expressly disclose that a multi-rate clock recovery device detects the LOL, but it is well known in the art for clock recovery circuits to detect an LOL in the signal (see 13 of fig. 9 in Maeda). It would have been obvious to one of ordinary skill in the art

at the time of invention to detect the LOL using a multi-rate clock recovery device as taught by Maeda in the system of Lin in order to provide clock speeds of references and actual measurements.

Regarding claims 2, 20, and 21, the combined invention of Lin and Maeda teaches that the CDR device is further arranged, in use, to detect a loss of signal (LOS) in the data signal received at the tributary receiver unit (paragraph 0014 of Lin).

Regarding claim 3, the combined invention of Lin and Maeda teaches that the CDR device comprises a 1R optical receiver element (12 of fig. 9 of Maeda) and a 2R binary detection element for detecting the LOS (16 of fig. 9 of Maeda).

Regarding claims 5 and 23, the combined invention of Lin and Maeda teaches that the path protection switching unit comprises an optical switch, and the control unit and the tributary receiver unit are located at the output side of the optical switch (paragraph 0028).

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Maeda and in further view of May (US Pub. No. 2003/0035179 A1).

Regarding claim 4, the combined invention of Lin and Maeda teaches the limitations of claim 1 but does not specifically teach that the control unit further comprises a signal quality detector unit for monitoring the quality of the data signal received at the tributary receiver unit. However, the use of signal quality detectors in receivers is well known in the art. For example, May teaches a signal quality detector for detecting the quality of a received signal in terms of BER, an eye diagram, Q, etc.

(paragraph 0025). It would have been obvious to one of ordinary skill in the art at the time of invention to use a signal quality detector as taught by May in the system of Maeda and Lin in order to verify and monitor the health of the received signals.

10. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of May.

Regarding claim 22, Lin teaches the limitations of claim 18 but does not specifically teach that the control unit further comprises a signal quality detector unit for monitoring the quality of the data signal received at the tributary receiver unit. However, the use of signal quality detectors in receivers is well known in the art. For example, May teaches a signal quality detector for detecting the quality of a received signal in terms of BER, an eye diagram, Q, etc. (paragraph 0025). It would have been obvious to one of ordinary skill in the art at the time of invention to use a signal quality detector as taught by May in the system of Lin in order to verify and monitor the health of the received signals.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Maeda and in further view of Morkel (US Patent No. 6,476,953 B1).

Regarding claim 7, the combined invention of Lin and Maeda teaches the limitations of claim 1 but does not expressly disclose that the node further comprises: one or more first network interface units arranged, in use, to demultiplex an incoming WDM optical signal and to convert the incoming WDM optical signal into a plurality of

electrical channel signals, a plurality of 3R regeneration units for regenerating the electrical channel signals, and one or more second network interface units arranged, in use, to convert and multiplex at least one of the electrical channel signals into an outgoing WDM optical signal. However, it is well known in the art to separate a signal into different channels and provide 3R regeneration to each channel. For example, Morkel teaches one or more first network interface units arranged, in use, to demultiplex an incoming WDM optical signal (34 of fig. 5) and to convert the incoming WDM optical signal into a plurality of electrical channel signals (14 of fig. 1), a plurality of 3R regeneration units for regenerating the electrical channel signals (10a-n of fig. 5), one or more second network interface units arranged, in use, to convert (20 of fig. 1) and multiplex at least one of the electrical channel signals into an outgoing WDM optical signal (32 of fig. 5). It would have been obvious to one of ordinary skill in the art at the time of invention to provide 3R regeneration to each of the channels by demultiplexing them as taught by Morkel in the system of Lin and Maeda in order to have amplified, reshaped and retimed signals so that the signal could be transmitted to longer distances with more accuracy.

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Maeda and Morkel and in further view of Arends (US Patent No. 4,330,870).

Regarding claim 8, the combined invention of Lin, Maeda, and Morkel teaches the limitations of claim 7 but does not expressly disclose that each 3R regeneration unit is arranged, in use, to detect a LOL in its associated electrical channel signal and to

force its output to a substantially static state in response to detecting the LOL. However, it is well known that in the retiming stage of 3R regeneration, data rates need to be retimed in accordance with a recovered clock signal. For example, Arends teaches an optical communications system for regeneration of an optical signal that detects the phase lock loss of the signal and forces its output to a substantially static state (col. 12, line 62 to col. 13, line 6). It would have been obvious to one of ordinary skill in the art at the time of invention to detect an LOL and force its output to a substantially static state as taught by Arends in the system of Maeda and Morkel in order to regenerate and retime the signal.

13. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Maeda, Morkel, and Arends and in further view of Marmur (US Patent No. 6,466,886 B1).

Regarding claim 9, the combined invention of Lin, Maeda, Morkel, and Arends teaches the limitations of claim 8 but does specifically disclose that each 3R regeneration unit is further arranged to detect a LOS in its associated electrical channel signal, and to force its output to a substantially static state in response to detecting the LOS. However, the detection of LOS in signal regeneration is well known. For example, Marmur teaches an optical communication system that detects an LOS (19 of fig. 1). It would have been obvious to one of ordinary skill in the art at the time of invention to detect an LOS as taught by Marmur in the system of Maeda, Morkel and Arends in order to ensure healthy signals and to reshape unhealthy signals.

14. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Morkel.

Regarding claim 25, Lin teaches the limitations of claim 18 but does not expressly disclose that the node further comprises: one or more first network interface units arranged, in use, to demultiplex an incoming WDM optical signal and to convert the incoming WDM optical signal into a plurality of electrical channel signals, a plurality of 3R regeneration units for regenerating the electrical channel signals, and one or more second network interface units arranged, in use, to convert and multiplex at least one of the electrical channel signals into an outgoing WDM optical signal. However, it is well known in the art to separate a signal into different channels and provide 3R regeneration to each channel. For example, Morkel teaches one or more first network interface units arranged, in use, to demultiplex an incoming WDM optical signal (34 of fig. 5) and to convert the incoming WDM optical signal into a plurality of electrical channel signals (14 of fig. 1), a plurality of 3R regeneration units for regenerating the electrical channel signals (10a-n of fig. 5), one or more second network interface units arranged, in use, to convert (20 of fig. 1) and multiplex at least one of the electrical channel signals into an outgoing WDM optical signal (32 of fig. 5). It would have been obvious to one of ordinary skill in the art at the time of invention to provide 3R regeneration to each of the channels by demultiplexing them as taught by Morkel in the system of Lin in order to have amplified, reshaped and retimed signals.

15. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Morkel and in further view of Arends.

Regarding claim 26, the combined invention of Lin and Morkel teaches the limitations of claim 25 but does not expressly disclose that each 3R regeneration unit is arranged, in use, to detect a LOL in its associated electrical channel signal and to force its output to a substantially static state in response to detecting the LOL. However, it is well known that in the retiming stage of 3R regeneration, data rates need to be retimed in accordance with a recovered clock signal. For example, Arends teaches an optical communications system for regeneration of an optical signal that detects the phase lock loss of the signal and forces its output to a substantially static state (col. 12, line 62 to col. 13, line 6). It would have been obvious to one of ordinary skill in the art at the time of invention to detect an LOL and force its output to a substantially static state as taught by Arends in the system of Lin and Morkel in order to regenerate and retime the signal.

16. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Morkel and Arends and in further view of Marmur.

Regarding claim 27, the combined invention of Lin, Morkel, and Arends teaches the limitations of claim 26 but does specifically disclose that each 3R regeneration unit is further arranged to detect a LOS in its associated electrical channel signal, and to force its output to a substantially static state in response to detecting the LOS. However, the detection of LOS in signal regeneration is well known. For example, Marmur teaches an optical communication system that detects an LOS (19 of fig. 1). It

would have been obvious to one of ordinary skill in the art at the time of invention to detect an LOS as taught by Marmur in the system of Lin, Morkel and Arends in order to ensure healthy signals and to reshape unhealthy signals.

17. Claims 13, 31, 36/13, and 37/31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morkel in view of Arends.

Regarding claims 13 and 31, Morkel teaches a node for use in a WDM optical network, the node comprising: one or more first network interface units arranged, in use, to demultiplex an incoming WDM optical signal (34 of fig. 5) and to convert the incoming WDM optical signal into a plurality of electrical channel signals (14 of fig. 1), a plurality of 3R regeneration units for regenerating the electrical channel signals (10a-n of fig. 5), one or more second network interface units arranged, in use, to convert (20 of fig. 1) and multiplex at least one of the electrical channel signals into an outgoing WDM optical signal (32 of fig. 5). Morkel does not specifically disclose that each 3R regeneration unit is arranged, in use, to detect a LOL in its associated electrical channel signal and to force its output to a substantially static state in response to detecting the LOL. However, it is well known that in the retiming stage of 3R regeneration, data rates need to be retimed in accordance with a recovered clock signal. For example, Arends teaches an optical communications system for regeneration of an optical signal that detects the phase lock loss of the signal and forces its output to a substantially static state (col. 12, line 62 to col. 13, line 6). It would have been obvious to one of ordinary skill in the art at the time of invention to detect an LOL and force its output to a

substantially static state as taught by Arends in the system of Morkel in order to regenerate and retime the signal.

Regarding claims 36/13 and 37/31, the combined invention of Morkel and Arends teaches a WDM network comprising a node as claimed in claims 13 and 31 respectively (fig. 5 of Morkel).

18. Claims 14 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morkel in view of Arends and in further view of Marmur.

Regarding claims 14 and 32, the combined invention of Morkel and Arends teaches the limitations of claims 13 and 31 respectively, but does specifically disclose that each 3R regeneration unit is further arranged to detect a LOS in its associated electrical channel signal, and to force its output to a substantially static state in response to detecting the LOS. However, the detection of LOS in signal regeneration is well known. For example, Marmur teaches an optical communication system that detects an LOS (19 of fig. 1). It would have been obvious to one of ordinary skill in the art at the time of invention to detect an LOS as taught by Marmur in the system of Morkel and Arends in order to ensure healthy signals and to reshape unhealthy signals.

19. Claims 6 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Sakamoto et al. (US Pub. No. 2005/0185577 A1).

Regarding claims 6 and 24, Lin teaches the limitations of claim 18 but does not expressly disclose that the step of switching to the protection path comprises utilizing an

electrical switch , and the method comprises the steps of: detecting LOSs and monitoring the quality of the data signals on both the working and the protection path before the electrical switch, and wherein the tributary receiver is located on the output side of the electrical switch and is arranged as an electrical receiver. Sakamoto teaches that the step of switching to the protection path comprises utilizing an electrical switch (82 of fig. 20; paragraph [0079]), and the method comprises the steps of: detecting LOLs and/or LOSs and monitoring the quality of the data signals on both the working and the protection path before the electrical switch (paragraph 0006), and wherein the tributary receiver is located on the output side of the electrical switch and is arranged as an electrical receiver (15 of fig. 20; paragraph 0071). It would have been obvious to one of ordinary skill in the art at the time of invention to use an electrical switch to switch between paths and to detect an LOS on the paths as taught by Sakamoto in the system of Lin in order to prevent discontinuities in path transmissions and to increase system reliability.

20. Claims 10-12, 15-17, and 28-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Lee whose telephone number is (571) 272-2220. The examiner can normally be reached on Monday - Friday, 9:00 am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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